

**I Claim:**

1. An injection molding apparatus comprising:  
a first sprue bar element having a first sprue channel for receiving a  
5 melt stream of moldable material under pressure;  
a second sprue bar element having a second sprue channel for  
selectively receiving said melt stream from said first sprue channel;  
a manifold having a manifold channel for receiving said melt stream  
from said second sprue channel and delivering the melt stream to a nozzle channel of  
10 a nozzle;  
a mold cavity receiving said melt stream from said nozzle, said nozzle  
channel communicating with said mold cavity through a mold gate;  
a first gate assembly coupled to an outlet of said first sprue bar element  
for selectively restricting the flow of said melt stream from said first sprue channel;  
15 a second gate assembly coupled to an inlet of said second sprue bar  
element for selectively restricting the flow of said melt stream from said second sprue  
channel; and  
wherein said first gate assembly and said second gate assembly are  
movable to restrict the flow of melt from said first sprue channel and said second  
20 sprue channel when the flow of said melt stream between said first sprue channel and  
said second sprue channel is interrupted.
2. The injection molding apparatus of claim 1, wherein said first gate  
assembly is located outside of said first sprue channel and said second gate assembly  
25 is located outside of said second sprue channel.
3. The injection molding apparatus of claim 1, wherein said first sprue bar  
element and said second sprue bar element are axially movable relative to one another  
between a first position, in which said outlet of said first sprue bar element is in  
30 communication with the inlet of said second sprue bar element and said first gate  
assembly and said second gate assembly are in an open position to allow flow between

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said first sprue bar and said second sprue bar, and a second position, in which said first sprue bar element and said second sprue bar element are axially separated from one another and said first gate assembly and said second gate assembly are in a closed position to restrict the flow of melt from said first sprue channel and said second sprue channel.

4. The injection molding apparatus of claim 3, wherein said first sprue bar element delivers said melt stream to said second sprue bar through a shear gate.

10 5. The injection molding apparatus of claim 4, wherein said first gate assembly is biased to restrict flow from said outlet and said second gate assembly is biased to restrict flow from said inlet.

15 6. The injection molding apparatus of claim 5, wherein said first gate assembly and said second gate assembly are movable in response to relative movement between said first sprue bar and said second sprue bar.

20 7. The injection molding machine of claim 6, wherein said first gate assembly and said second gate assembly are movable between said open position and said closed position, simultaneously.

25 8. The injection molding apparatus of claim 4, wherein said first sprue channel and said second sprue channel share a common axis, said shear gate being aligned with said common axis.

9. The injection molding apparatus of claim 8, further comprising a shoulder projecting from said first sprue channel adjacent said outlet, said first gate assembly being mounted on said shoulder.

30 10. The injection molding apparatus of claim 9, wherein said first gate assembly includes a cover plate that is mounted on a post, said post being mounted in

a recess formed in said shoulder, said post interacting with a biasing device located in said recess for moving said first gate assembly from said open position to said closed position.

5 11. The injection molding apparatus of claim 10, wherein said cover plate is axially movable towards said open position in response to an axial force applied by an end surface of said second sprue bar element.

10 12. The injection molding apparatus of claim 11, wherein said second gate assembly is generally identical to said first gate assembly, said second gate assembly being axially movable towards said open position in response to an axial force applied by an end surface of said first sprue bar element.

15 13. A sprue bar gate assembly for a stack mold, said gate assembly comprising:  
a first gate assembly coupled to an outlet of a first sprue bar element;  
a second gate assembly coupled to an inlet of a second sprue bar element; and

20 wherein the inlet of said second sprue bar element receives a melt stream of moldable material from the outlet of said first sprue bar element when said first gate assembly and said second gate assembly are in an open position and said inlet and said outlet are aligned.

25 14. A stack injection molding apparatus comprising:  
a stationary platen;  
a first movable platen coupled to said stationary platen and movable into and out of engagement with said stationary platen;  
a second movable platen coupled to said stationary platen and movable into and out of engagement with said first movable platen;

a first sprue bar element having a first sprue channel for receiving a melt stream of moldable material under pressure, said first sprue bar for coupling to a machine nozzle;

5 a second sprue bar element having a second sprue channel for selectively receiving said melt stream from said first sprue channel;

a manifold coupled to said first movable platen, said manifold having a manifold channel for receiving said melt stream from said second sprue channel and delivering said melt stream to a first nozzle channel of a first nozzle and to a second nozzle channel of a second nozzle;

10 a first mold cavity provided between said stationary platen and said first movable platen, said first mold cavity receiving said melt stream from said first nozzle channel through a first mold gate;

a second mold cavity provided between said first movable platen and said second movable platen, said second mold cavity receiving said melt stream from  
15 said second nozzle channel through a second mold gate;

a first gate assembly coupled to an outlet of said first sprue bar element for selectively restricting the flow of said melt from said outlet; and

wherein said first gate assembly is movable to restrict the flow of said melt stream from said outlet when the flow of said melt stream between said first  
20 sprue channel and said second sprue channel is interrupted.

15. An injection molding apparatus comprising:

a sprue bar having a channel extending therethrough, said channel having an inlet for receiving a melt stream of moldable material;

25 a manifold having a manifold channel for receiving said melt stream from an outlet of said sprue channel and delivering the melt stream to a nozzle channel of a nozzle;

a mold cavity receiving said melt stream from said nozzle, said nozzle channel communicating with said mold cavity through a mold gate;

30 a melt transfer device located along the length of said sprue bar, said melt transfer device for selectively providing a path for said melt stream to flow

between a first portion of said sprue bar and a second portion of said sprue bar, said melt transfer device being movable to interrupt said path; and

a gate assembly coupled to said melt transfer device, said gate assembly being movable to restrict the flow of melt from at least a first channel of said first sprue bar portion of said sprue bar when said path is interrupted.

16. The injection molding apparatus of claim 15, wherein movement of said melt transfer device causes said gate assembly to restrict the flow of said melt stream.

17. An injection molding apparatus comprising:

a first sprue bar element having a first sprue channel for receiving a melt stream of moldable material under pressure;

a second movable sprue bar element having a second sprue channel for selectively receiving said melt stream from said first sprue channel, said second sprue element having a first position and a second position relative to the first sprue bar element;

a first gate assembly located outside said first sprue channel and coupled to an outlet of said first sprue channel;

a second gate assembly located outside said second sprue channel and coupled to an inlet of said second sprue channel; and

wherein said first gate assembly and said second gate assembly are movable to restrict the flow of melt from said first sprue channel and said second sprue channel when said second sprue bar element moves from the first position to the second position.

18. An injection molding apparatus comprising:

a first sprue bar element having a first sprue channel for receiving a melt stream of moldable material under pressure;

a second movable sprue bar element having a second sprue channel for selectively receiving said melt stream from said first sprue channel;

a first gate assembly located outside said first sprue channel and coupled to an outlet of said first sprue channel, said first gate assembly being movable from a first position to a second position;

5 a second gate assembly located outside said second sprue channel and coupled to an inlet of said second sprue channel, said second gate assembly being movable from a first position to a second position; and

wherein said first gate assembly and said second gate assembly cooperate to control the flow of melt from said first sprue channel and said second sprue channel.

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19. An injection molding apparatus according to claim 18, wherein said second position of said first gate assembly and said second position of said second gate assembly inhibit the flow of melt from said first sprue channel and said second sprue channel.

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20. An injection molding apparatus comprising:

a first sprue bar element having a first sprue channel for receiving a melt stream of moldable material under pressure;

20 a second movable sprue bar element having a second sprue channel for selectively receiving said melt stream from said first sprue channel, said second movable sprue bar element being movable between a melt delivery position and a melt interrupted position;

25 a first gate assembly located outside said first sprue channel and coupled to an outlet of said first sprue channel, said first gate assembly being movable from a first position to a second position;

a second gate assembly located outside said second sprue channel and coupled to an inlet of said second sprue channel, said second gate assembly being movable from a first position to a second position; and

30 wherein said first gate assembly and said second gate assembly are actuated by the movement of said second movable sprue bar element from said melt delivery position to said melt interrupted position.